Armed Forces College of Medicine

AFCM

كلية الطب بالقوات المسلحة

Armed Forces College of Medicine

Assessment of Hydration Status

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Intended Learning Outcomes (ILOs)

By the end of this session the student will be able to:

Assess the hydration status of a patient properly using bedside charts, patient's data and general examination

Hydration Status Assessment

- Being able to assess the hydration status of a patient is an important skill that you’ll regularly use in clinical practice.
- It involves assessment of whether a patient is **hypovolaemic** (dehydrated), **euvolaemic** or **hypervolaemic** (fluid overloaded) to inform ongoing clinical management.

- Hypovolaemia refers to an overall deficit of fluid in the body. Causes include poor fluid intake, excessive fluid loss (e.g. vomiting, diarrhoea, haemorrhage, excessive diuretic therapy) and third space loss of fluid (where fluid remains within the body but has shifted from the intravascular space to another compartment within the body).

- Hypervolaemia refers to an excess of fluid in the body. It is often referred to as fluid overload. Hypervolaemia is common in the elderly and those with renal or cardiac failure. It can be caused by excessive fluid intake or inappropriate fluid retention (e.g. heart failure, renal failure).

General Examination

- Introduce yourself to the patient including your name and role.
- Confirm the patient’s name and date of birth.
- Briefly explain what the examination will involve using patient-friendly language.
- Gain consent to proceed with the examination.
- Wash your hands.
- Ask the patient if they have any pain before proceeding with the clinical

General Inspection

- **Patient**: stable, alert, breathlessness, fever, portals of infection/wounds/drains

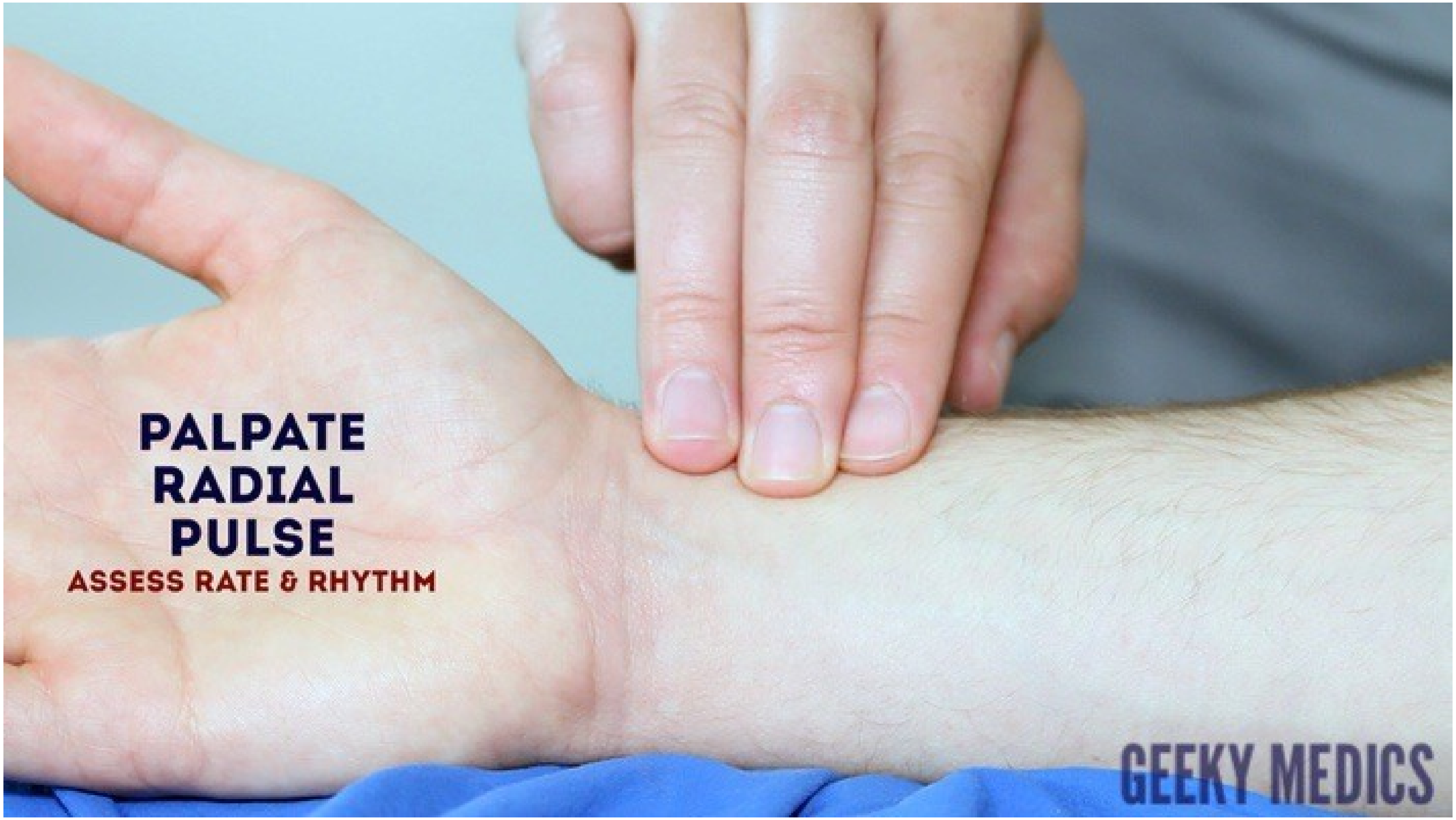
- **Around bed** (if present look at quantity of fluids in/out)
  - In: IV fluids
  - Out: catheter, stoma, NG tube, vomit/sputum bowels
  - Charts: observations, fluid balance, drug chart (diuretics)

Vital Data

- Pulse: volume, rate and peripheral pulsations
- Blood pressure: sitting and standing
- Temperature
- Respiratory rate

Radial pulse

- Palpate the patient’s radial pulse, located at the radial side of the wrist, with the tips of your index and middle fingers aligned longitudinally over the course of the artery.
- Once you have located the radial pulse, assess the rate and rhythm.

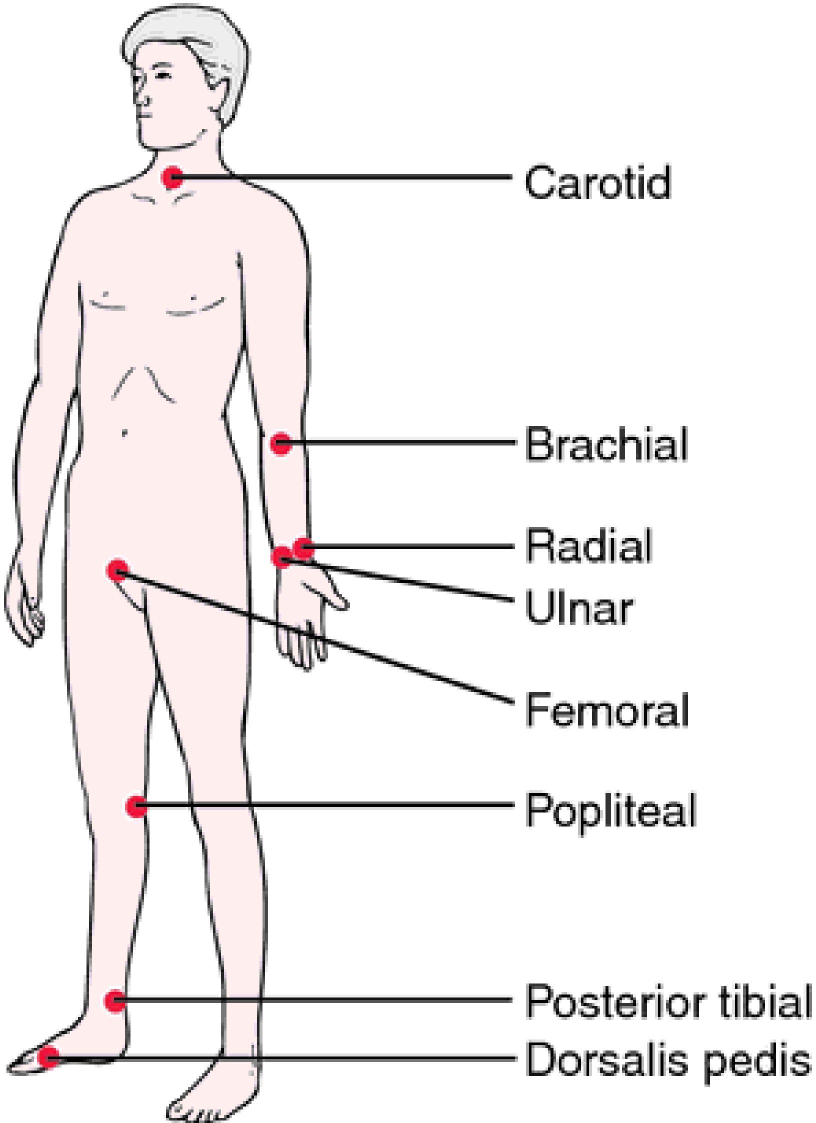

PALPATE
RADIAL
PULSE
ASSESS RATE & RHYTHM
GEEKY MEDICS

Comment on

1. **Rate:**
2. Rhythm
3. **Volume:**
4. **Special character**
5. Equality **of both radial pulse (volume).**
6. **Vessel wall**
7. **Peripheral pulsation**

Examination of palpable arterial pulsations

- Carotid artery
- Brachial artery
- Radial artery
- Femoral artery
- Popliteal artery
- Posterior tabial artery
- Dorsalis pedis artery

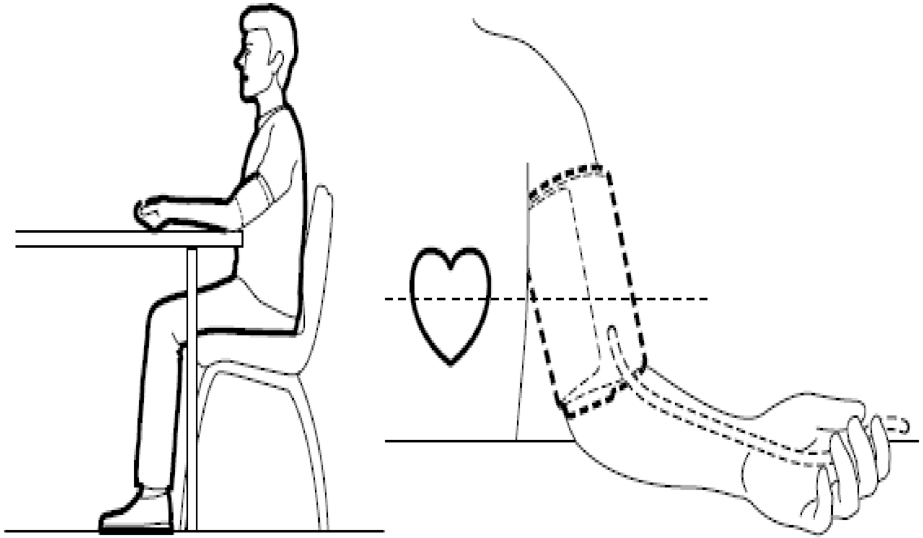


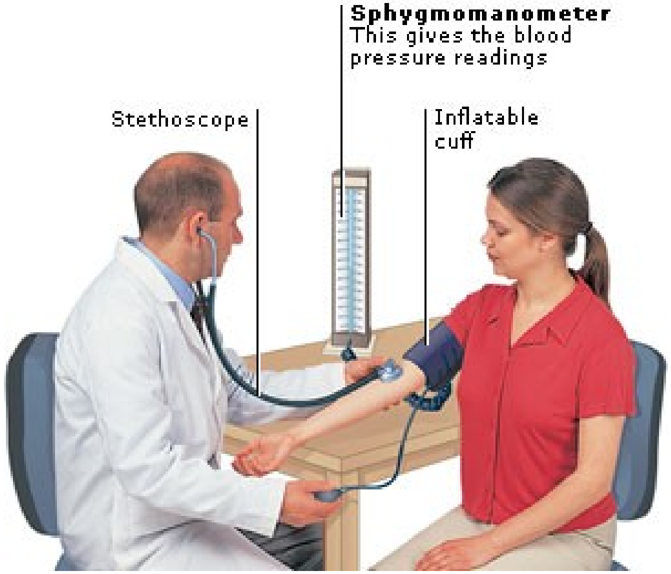
Blood pressure

- Measure the patient’s blood pressure in both arms.
- A comprehensive blood pressure assessment should also include lying and standing blood pressure.

Select a Cuff Size Based on Arm Circumference

The **ideal cuff bladder length** is ≥ 80 percent of the patient's arm circumference. The **ideal cuff bladder width** is ≥ 40 percent of the patient's arm circumference.





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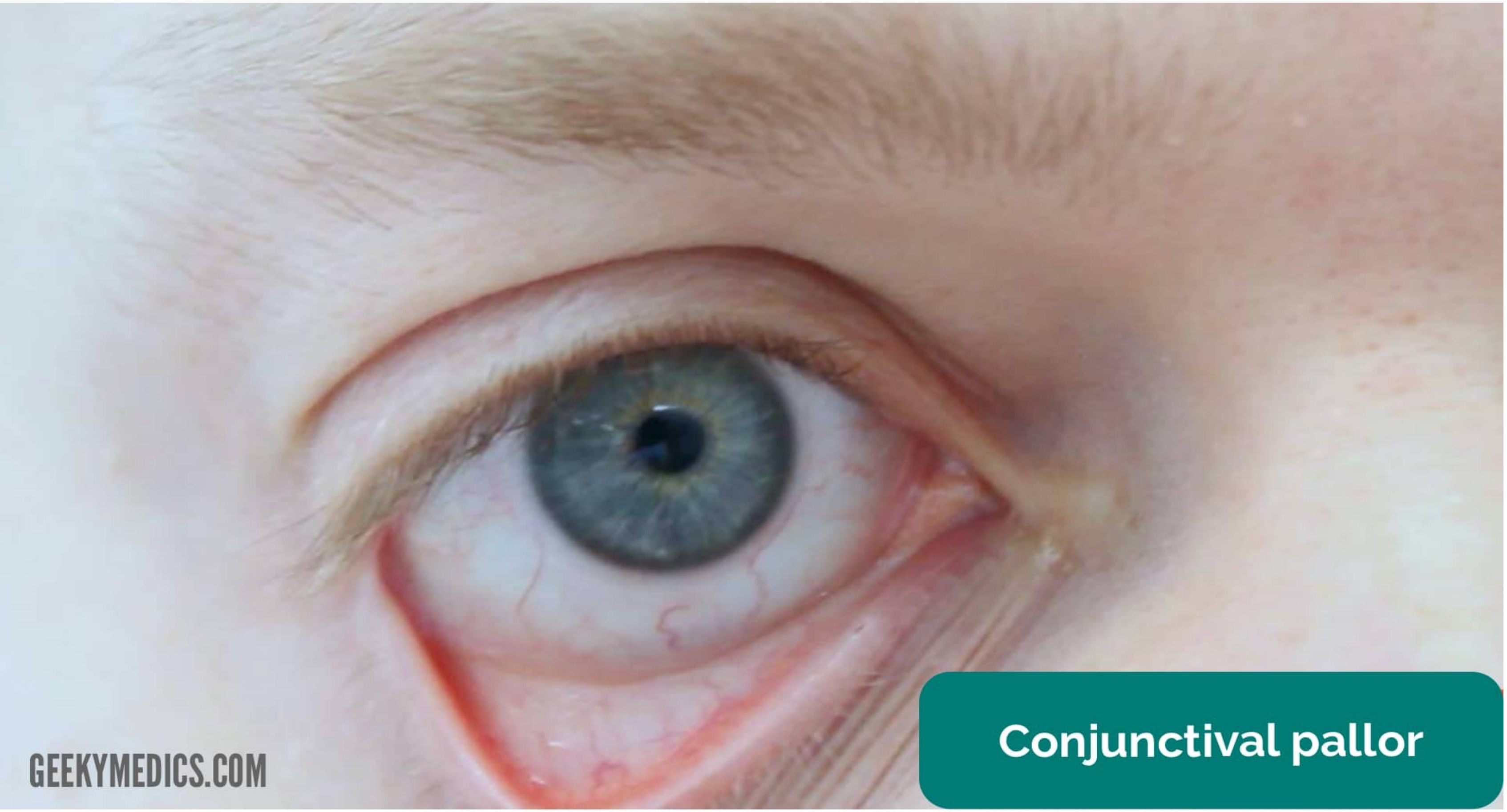
Head and Neck

- Eyes: sunken
- Mouth: dry mucous membranes
- Jugular venous pressure (JVP)
- Carotid volume and character

Eyes

Inspect the eyes for signs relevant to the patient’s fluid status:

- Sunken appearance: associated with hypovolaemia.
- Conjunctival pallor: suggestive of underlying anemia.



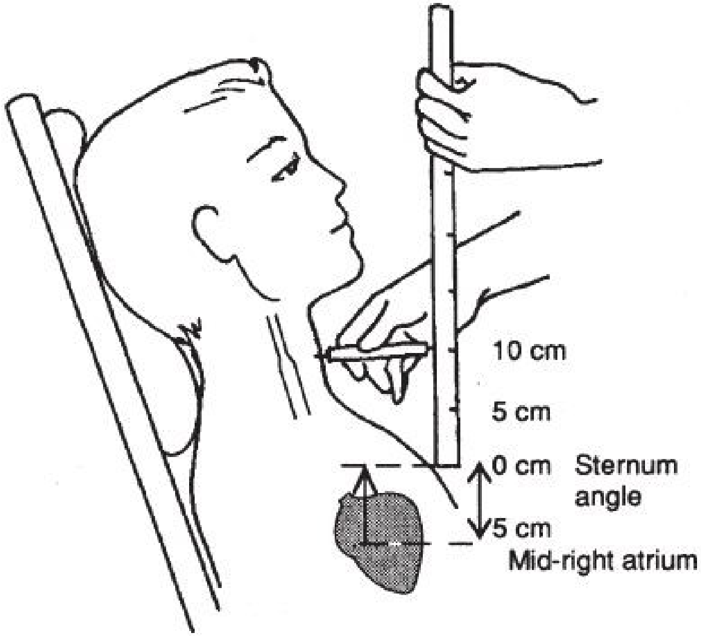
Conjunctival pallor

Mouth

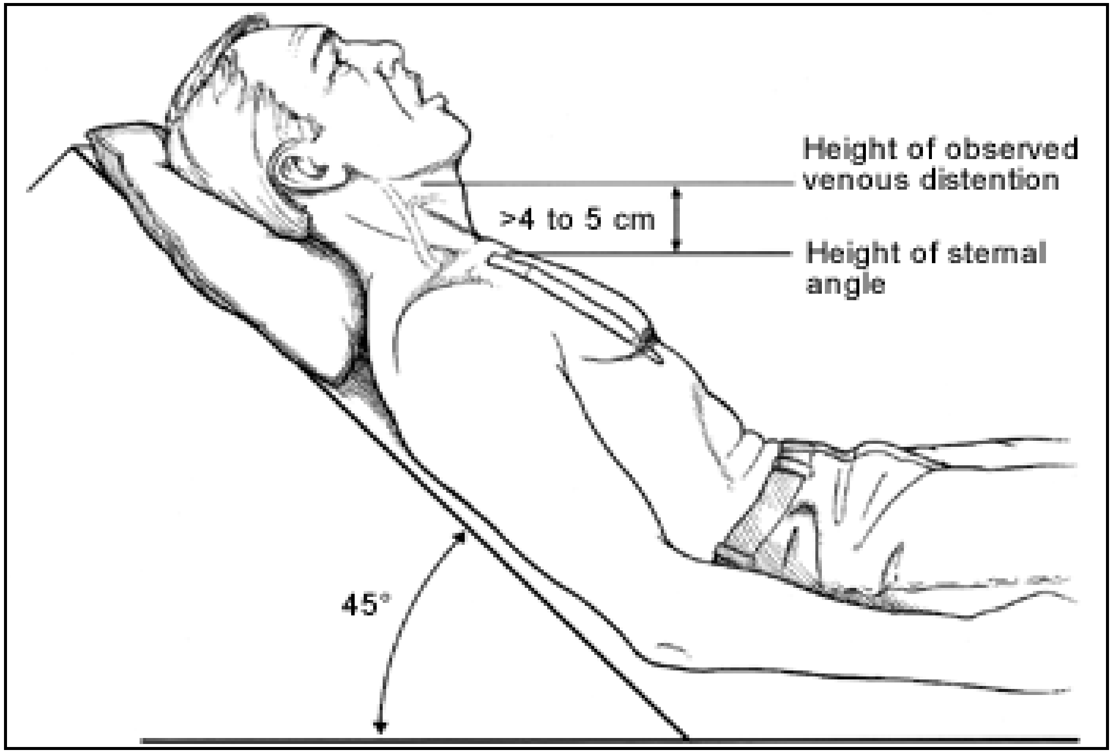
- Inspect the mouth for signs relevant to the patient’s fluid status.
- Dry mucous membranes: associated with hypovolemia.

Measure the JVP

- Position the patient in a semi-recumbent position (at 45°).
- Ask the patient to turn their head slightly to the left.
- Measure the JVP by assessing the vertical distance between the sternal angle and the top of the pulsation point of the IJV (in healthy individuals, this should be no greater than 3 cm).



d) If venous pulsations: Identify the highest point of pulsation then measure the vertical distance of this point above the sternal angle (Venous pressure)



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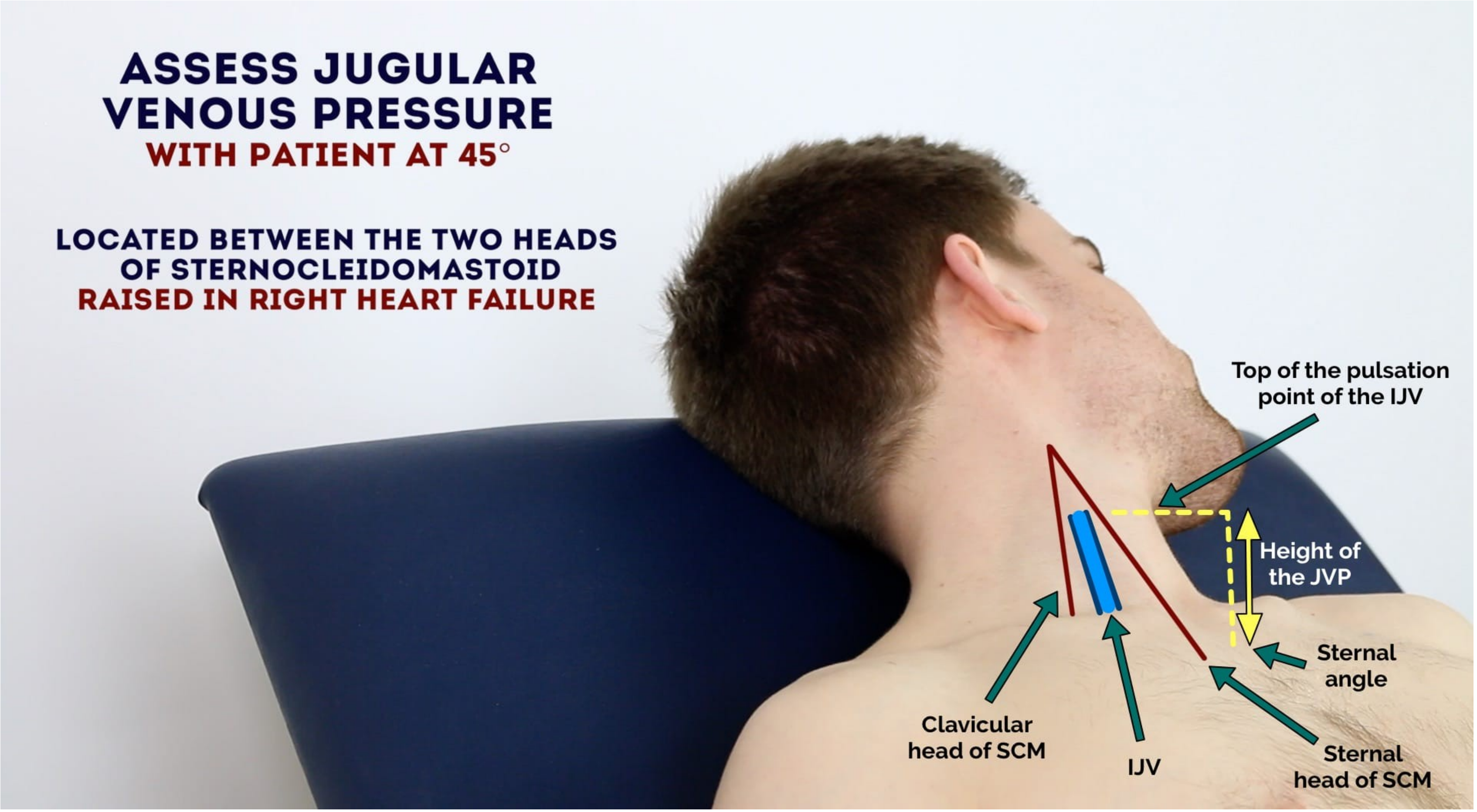


ASSESS JUGULAR VENOUS PRESSURE

WITH PATIENT AT 45°

LOCATED BETWEEN THE TWO HEADS OF STERNOCLEIDOMASTOID

RAISED IN RIGHT HEART FAILURE

Upper and lower limbs

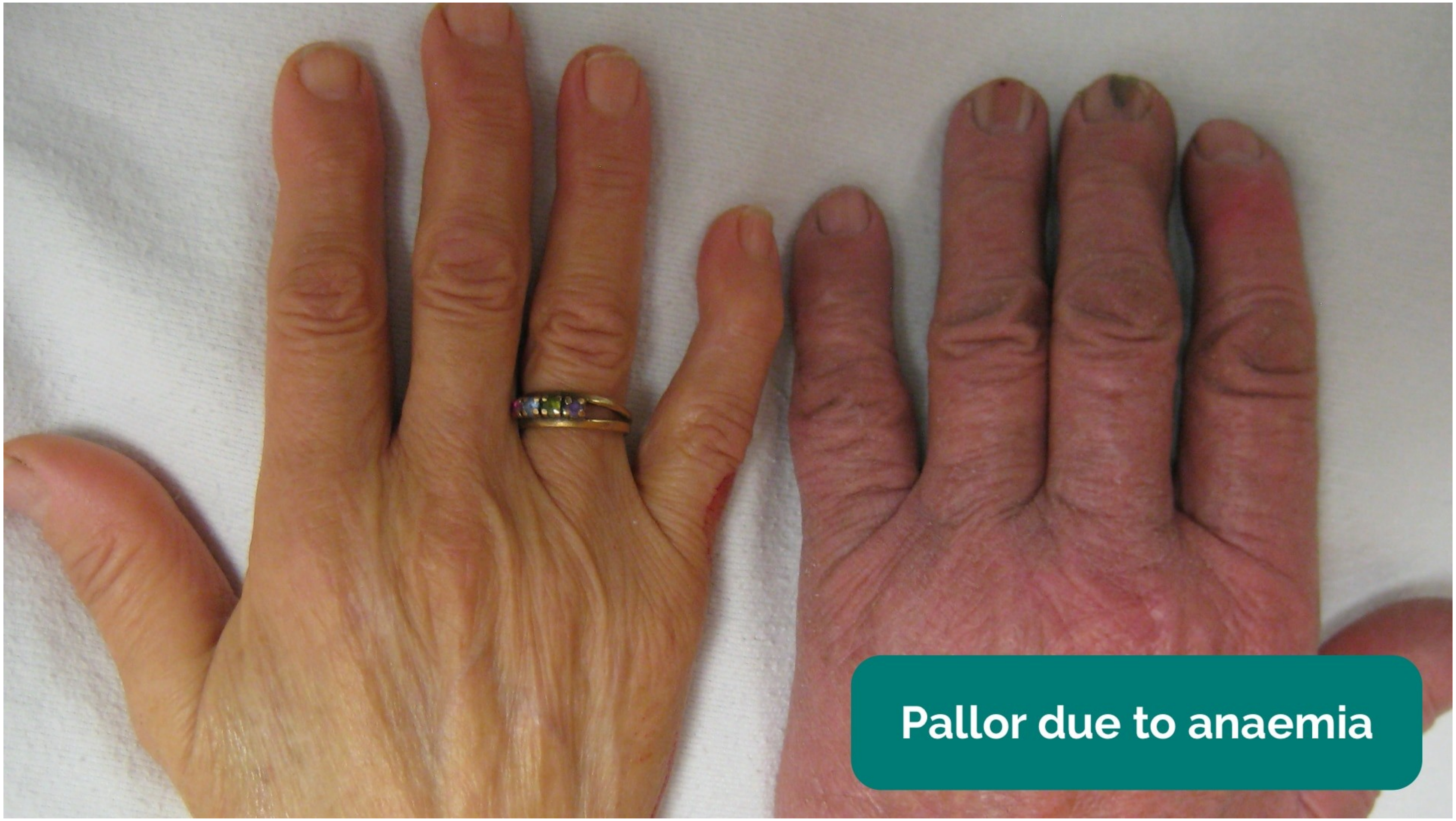
- **Hand Examination**: color, leukonychia, temperature, capillary refill time, skin turgor

- **Lower Limbs:** Peripheral edema

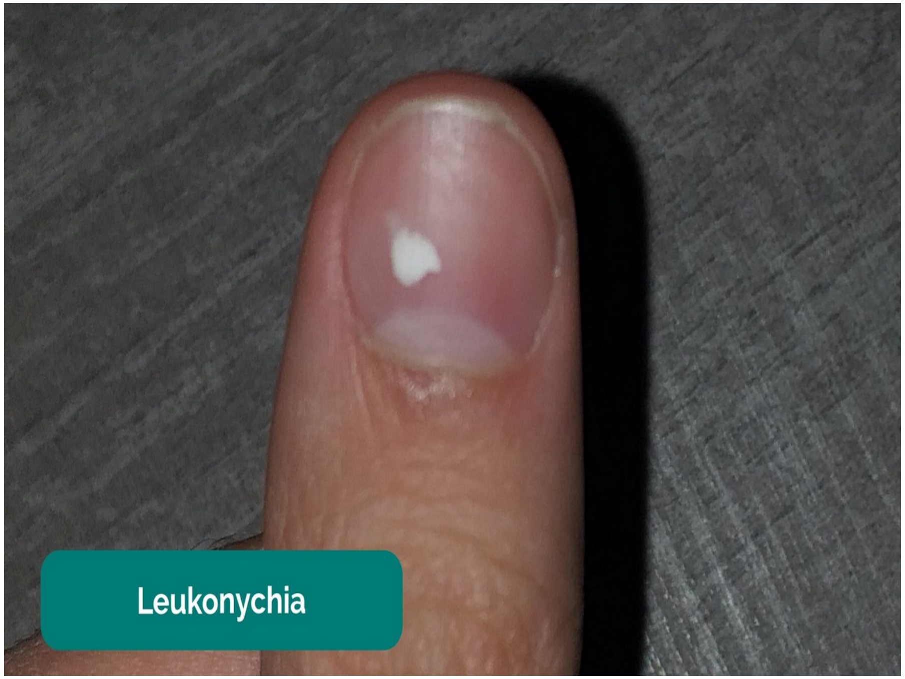
Hands

The hands can provide lots of clinically relevant information and therefore a focused, structured assessment is essential.

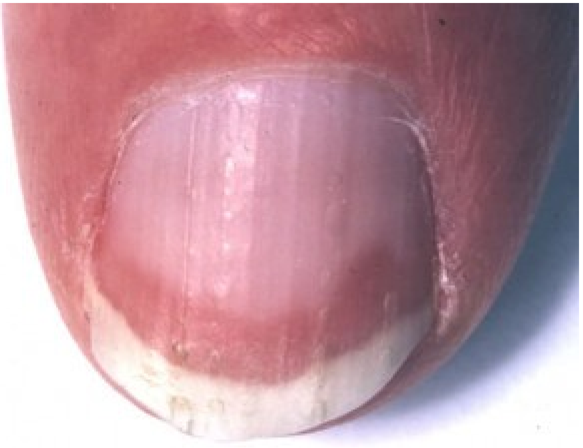
- **Colour**: pallor suggests poor peripheral perfusion (e.g. congestive heart failure, hypovolaemia) and cyanosis may indicate underlying hypoxaemia.
- **Leukonychia**: whitening of the nail bed, associated with hypoalbuminemia.
- **Cool hands** may suggest poor peripheral perfusion.



Pallor due to anaemia



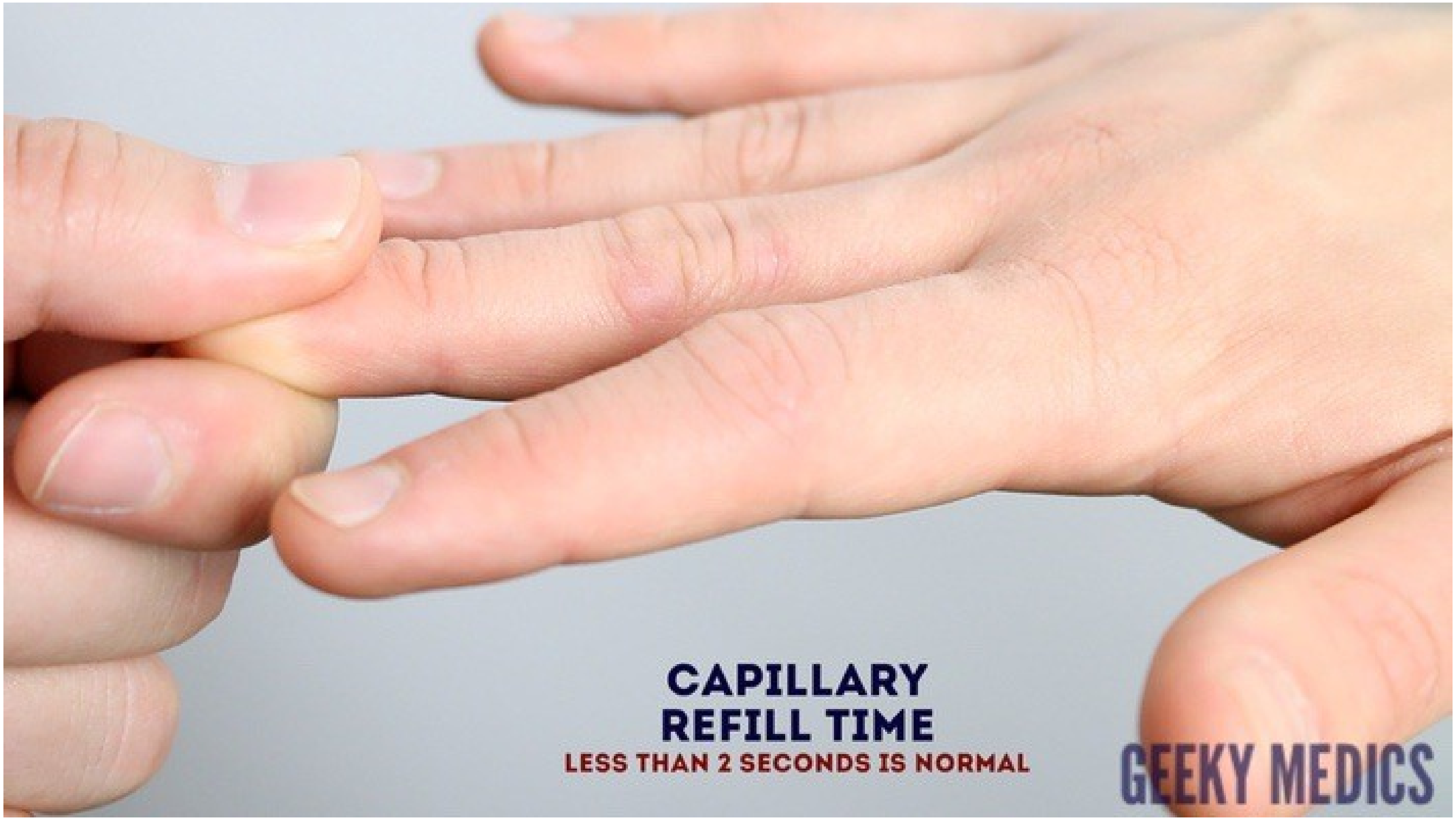
Terry nails have been associated with:



- Liver cirrhosis
- Chronic kidney disease
- Heart failure
- Protein malabsorption, eg in colitis
- Protein-losing enteropathy
- Diabetes
- Iron deficiency anaemia
- Zinc deficiency

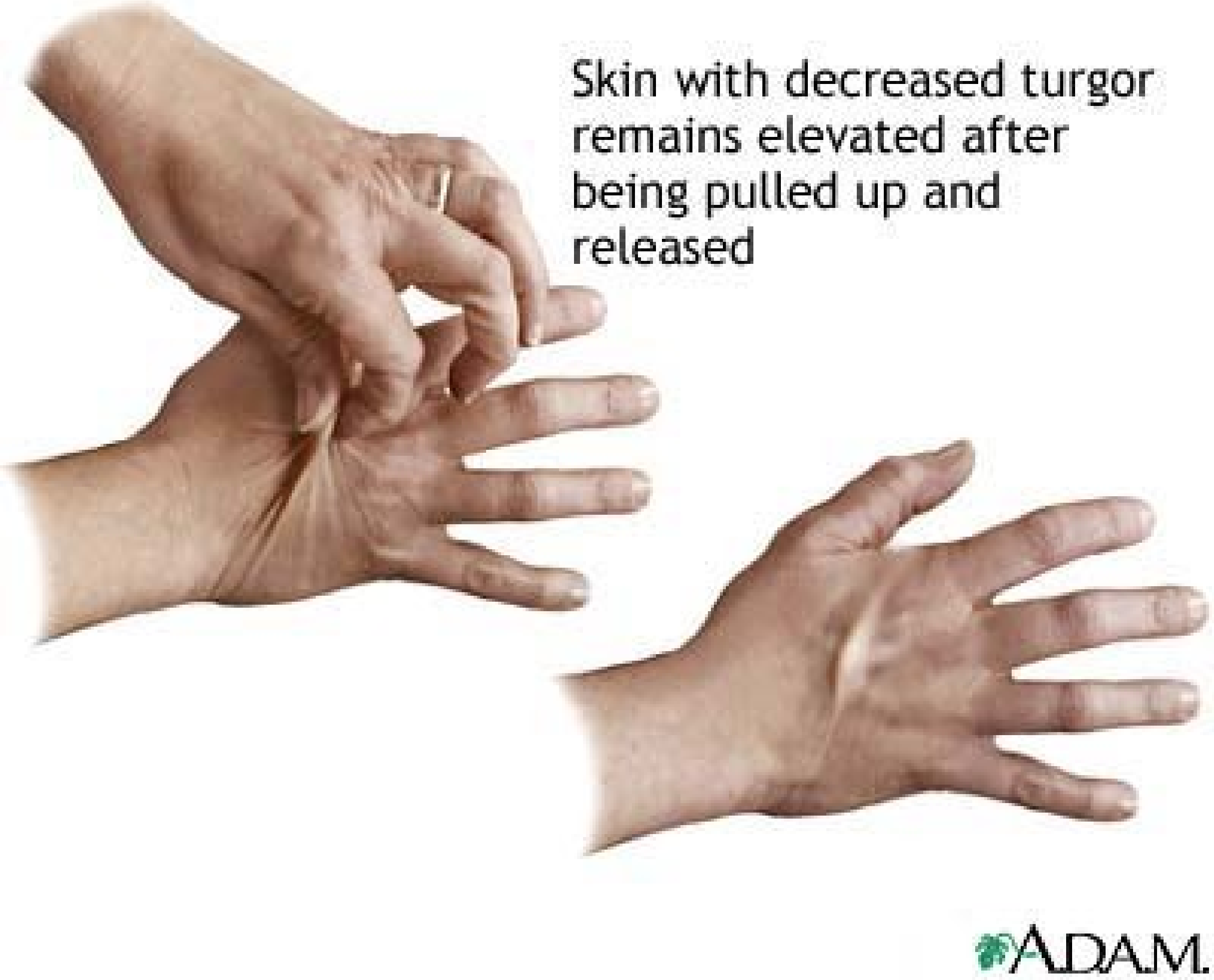
Capillary refill time (CRT):

- Measuring capillary refill time (CRT) in the hands is a useful way of assessing peripheral perfusion.
- A CRT that is greater than two seconds suggests poor peripheral perfusion.


CAPILLARY
REFILL TIME
LESS THAN 2 SECONDS IS NORMAL
GEEKY MEDICS

Skin turgor

- Assess skin turgor by gently pinching a fold of skin (this can be done on the back of the hand), holding for a few seconds and then releasing the skin.
- Well hydrated skin should spring back to its previous position immediately, whereas dehydrated skin will slowly return to normal (this is known as decreased skin turgor).



Skin with decreased turgor remains elevated after being pulled up and released

A.D.A.M.

Chest Examination

- Sternum: capillary refill, skin turgor
- Back examination: auscultation of lung bases (fine crepitations, pulmonary edema in overload)

Cardiac Examination

- Palpation: apex beat
- Auscultation: heart (3rd heart sound in overload)

Abdomen Examination

- Ascites

To Complete examination

- Thank patient and cover him/her
- “To complete hydration status assessment, you have to take a full history, look at U&Es, observations and the fluid balance chart”
- Summarize and suggest further investigations e.g.
  - Serial weights
  - Catheterize
  - U&Es
  - ABG and serum lactate

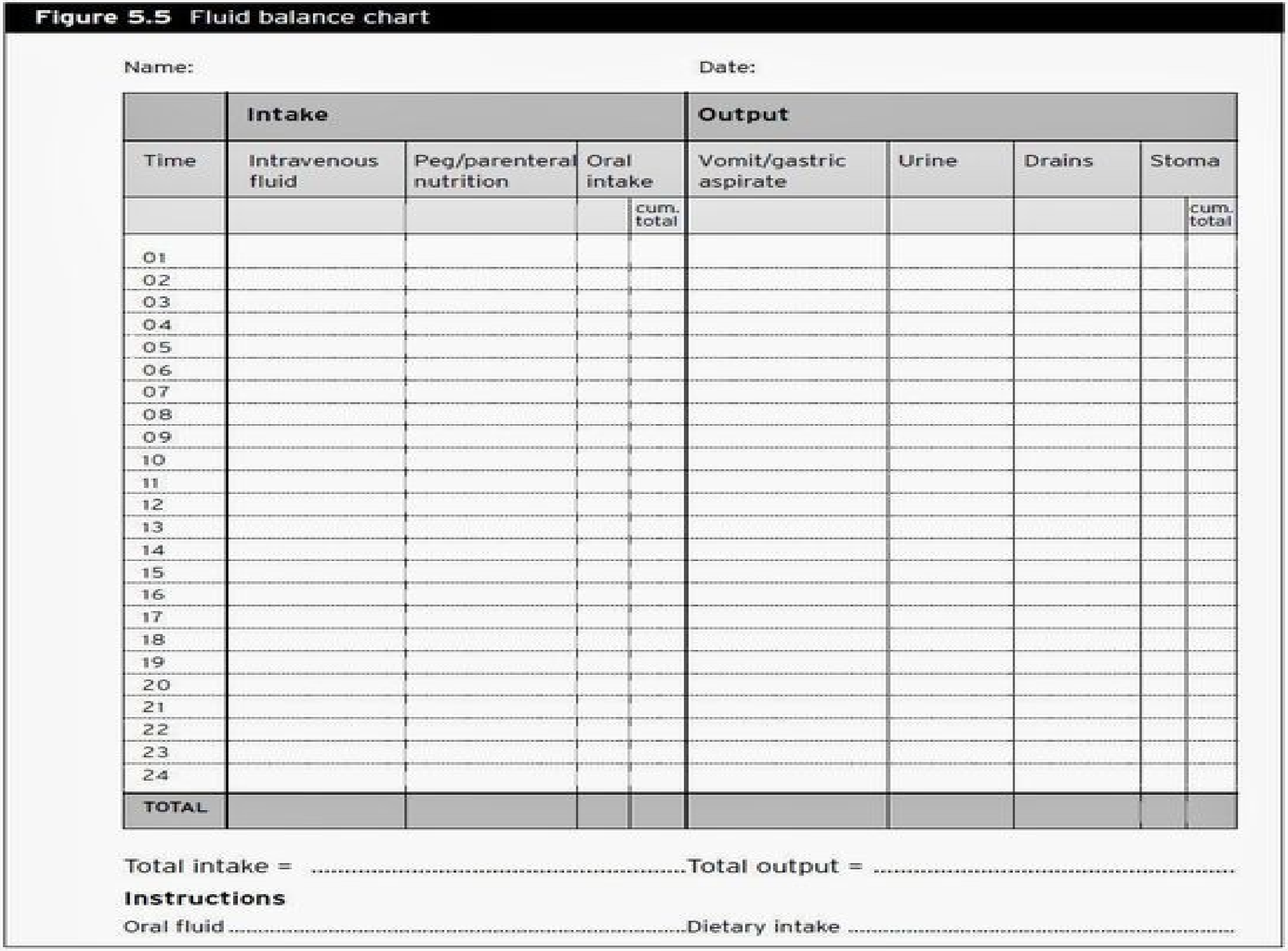


Figure 5.5 Fluid balance chart

Name:

Date:

	Intake				Output				
Time	Intravenous fluid	Peg/parenteral nutrition	Oral intake		Vomit/gastric aspirate	Urine	Drains	Stoma	
				cum. total					cum. total
01									
02									
03									
04									
05									
06									
07									
08									
09									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
TOTAL									

Total intake = ……………………………………………… Total output = ………………………………………………

Instructions

Oral fluid ……………………………………………………… Dietary intake ………………………………………………

Watch the following video for proper examination and assessment of hydration status

Thank You